ORIGINAL

1120 Connecticut Avenue NW
Suite 400
Washington, D.C. 20036
(202) 776-1550
(202) 776-1555 Fax

WORLDCOM

EX PARTE OR LATE FILED

October 16, 1997

RECEIVED
OCT 16 1997
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

DOCKET FILE COPY ORIGINAL

Re: *Ex Parte* – CC Docket Nos. 96-45 and 97-160
Universal Service Cost Models

Dear Mr. Caton:

Recently[1], the FCC requested comments on the customer location and outside plant algorithms that should be incorporated into one or more of the service costing models proposed by several parties for use in determining a cost benchmark for high-cost fund support to be distributed to non-rural telephone companies through the Commission's universal service fund. Many parties already have responded, but continuing developments at the ongoing Universal Service Branch cost model workshops require additional comment.

The FCC Should Define Customer Locations by Geo-code

In its Comments on customer location issues,[2] WorldCom observed that identifying customer locations by census block or grid was a significant improvement over the previous attempts to locate customers by census block group. Both BCPM and FCC staff developed new census block/grid methods of locating customers, while Hatfield proposes to identify customer locations by geo-code. All three methods advance the quality of the customer location algorithm, but the Hatfield method seems to have the most promise.

[1] Further Notice of Proposed Rulemaking, CC Docket Nos. 96-45 and 97-160, Released July 18, 1997,

[2] Comments of WorldCom, Inc., CC Docket Nos. 96-45 and 97-160, September 2, 1997.

No. of Copies rec'd 0+11
List ABCDE

There are several reasons why geo-coding will produce the best result:

- Geo-coding accurately identifies the locations of subscribers, and, perhaps as importantly, effectively defines where there are no potential customers. Obtuse algorithms, like Hatfield's window panes or BCPM's road-reduced areas, need not be developed to locate customers or to exclude unpopulated areas;

- Geo-coded customer locations (residential and business) can be mapped on the same grid as geo-coded roads and geo-coded wire-center boundaries (both of which are available) and, thus, will more accurately assign customers to wire-centers and will allow the models to restrict cable routes to following roadways. Both improvements address specific concerns of the Rural Utility Service and should reduce outside plant costs by not routing either feeder or distribution cable through areas with no demand or no roads;[3]

- By clustering customers along roadways, geo-coding also effectively draws serving area boundaries between clusters (that is, not along roads) rather than through clusters. By using census blocks or grids that define boundaries based on roadways, the models often place two cables down the same boundary road – either the model will place a cable to serve each side of the road, rather than one to serve both sides of the road, or it will create a service area where customers are located along the roadway defined edges, but will try to locate equipment in the center of the defined area even when there are no customers and no roads near the center;

- Finally, and perhaps most significantly, geo-coding households will allow the models to include unserved households. Currently, each model "closes" to ILEC provided (or estimated) working line counts by wire-center. This step will remain necessary, but we should add an "unserved" factor for each wire center and be sure we've provided plant sufficient to accomplish our "universal service" objective. Use of geo-coded location information will be particularly helpful in those southern and western states that have a relatively large unserved populace spread over large geographic areas.[4]

The primary complaint about geo-coding is that data does not exist for a significant portion of households – particularly rural households. While this is a valid short-term concern, the Commission should not let this temporary problem

[3] See the Gunnison, CO, example where BCPM forces cable routes across mountains when customers actually are located along valley roads between the mountains.

[4] Of course, any carrier should receive universal service fund compensation only for those customers it actually serves – not necessarily the total of all potential customers in a wire center. This issue has been addressed in previous WorldCom (or MFS) filings and will be addressed again as the Commission decides how to distribute universal service fund payments.

sway its decision to adopt a customer location algorithm based on geo-coding. The Commission now seeks to define costs for non-rural local carriers. Most of these carriers today receive very little high-cost fund support. So, if the Commission adopts a cost model that relies on geo-coded information, and if the closing factors do not provide a reasonable estimate of the actual numbers of rural subscribers, then the model may understate the number of rural households served by non-rural carriers. This might result in these carriers receiving less universal service support than they would otherwise deserve – but they receive none today. This might motivate non-rural LECs to collect the data missing from their service areas. Should the Commission decide to use the same costing model to determine high-cost fund support for rural LECs, those carriers would have three years to gather the missing data. Given the availability of hand-held global positioning satellite (GPS) devices, these carriers have the choice of gathering the missing data themselves or using any of a number of commercial services to create the geo-code data.

Other Outside Plant Issues Must Be Addressed

Type of Facility Construction

The Commission also asked a number of questions about outside plant design algorithms. Although workshops on this subject are continuing, the parties seem to have disclosed additional useful information that the Commission should consider as it prepares any interim orders or public notices on this issue. The Commission asked whether the models should select the type of plant construction based on terrain and density factors rather than on broad percentage distribution tables. Many commenters, and now the model proponents, endorse linking the type of construction to terrain factors. For example, in swampy, very rocky and high-slope terrains, the preferred placement likely would be aerial. In very dense urban areas and in the area immediately surrounding suburban central offices, underground construction would be preferred. Everywhere else buried construction likely would be preferred. But, even these broad rules have exceptions. Again using Gunnison as an example, and assuming the Commission decides to use geo-coded customer location information rather than the "average lot size" algorithms of previous models, cables to serve Gunnison subscribers most likely would be buried along the shoulder of roads even though the census block terrain codes indicate high-slope and very-rocky conditions that otherwise would suggest aerial placement. At some point, we all must accept that the models are just that – models of reality that will not yield the most desirable engineering solution in every case.

Drop Lengths

Concerning drop lengths, if the Commission uses geo-coded customer locations and geo-coded road data, and if feeder and distribution

cables are constrained to follow roadways, then the selected model could calculate a drop length for every customer. Or, rather than address every customer location, the model could calculate a length for drops only in areas below a certain specified population threshold density.

Loop Design

One area of keen interest to WorldCom has been the outside plant loop design standard. There have been several contentious discussions of loop standards in the cost model workshops, but participants seem to have reached some common understandings of the technical capabilities without adopting a standard. We now agree digital services at least to the level of ISDN can be provisioned over properly designed copper loops up to 18 kilofeet ("kf") long. The 18 kf limit is based on a central office supervision limit of 1,500 ohms. We debated whether you also could use a 1,500 ohm copper range beyond a digital loop carrier system. We finally concluded you can, but there are two remote DLC plug-ins – one for copper extensions less than 900 ohms and one for copper extensions from the DLC of 900 to 1,500 ohms. The cost of the second type of plug-in is about double the cost of the first, but you avoid the cost of multiple DLC base cabinets – with an 1,500 ohm range one DLC base could serve an area that would require four DLC base cabinets if each had a 900 ohm range. Of course, these are maximum distances; we would expect many suburban DLCs would be placed in areas where the DLC capacity would be exhausted serving customers at much shorter distances than the maximum, with many (if not most) requiring no long-loop plug-ins. And, as discussed below, we urge the Commission to consider wireless technology in primarily rural areas where the population is so sparse that DLCs cannot be deployed economically.

A loop provisioned over 18 kf of copper is also known as an 8 dB loop. Some parties observe that PBX trunks and Centrex loops must be designed to a 4.5 to 5.5 dB standard (typically, a 5 dB loop). WorldCom believes the standard industry practice is to install an amplifier either in the central office or at the customer's premises to achieve the required gain only as needed on loops that exceed the desired loss characteristic. The outside plant design is not changed.

WorldCom also has been concerned that, if the Commission does not choose a loop standard, the competing models would not produce comparable results. Two standards are typically used: CSA and RRD. CSA provides a loop quality that is excessive for voice service and that would allow the incumbents to enter new markets, like video dial-tone, using facilities that are subsidized by the universal service fund. On the other hand, RRD provides a loop optimized for voice and yet, with additional electronics, capable of supporting ISDN and even xDSL services at digital speeds up to 1.54 mbps. We think this standard will more than satisfy the legislative mandate to make

advanced services available while at the same time subsidizing just the quality of loop needed to support those services the Commission already has defined as necessary for universal service. WorldCom does not object to incumbents designing and operating their local loop plant to the CSA standard, we simply feel the universal service high-cost fund should not subsidize that design.

Although we have not finished the workshop discussions, WorldCom continues to support a loop design based on 18 kf copper loops extending from either the serving wire center or subtending DLC locations. We believe this design can easily be employed in any of the models now being considered -- BCPM, Hatfield or Staff. We would recommend 26 gauge copper or fiber in all feeder routes and 24 gauge cooper in all distribution plant. 24 gauge copper distribution will raise loop costs slightly, but it will eliminate any need for a model to determine whether to use 24 or 26 gauge in distribution. It also will provide better performance at the 18 kf maximum length. In fact, that maximum length often could be extended if loops are provisioned with only 24 gauge copper in distribution plant, but WorldCom respectfully suggests the Commission allow some slight extra transmission capability in its model. In no case does WorldCom support a loop design that utilizes load coils.

Fiber-Copper Cross-over

The Commission also asks what cross-over point should be used to determine whether to use fiber or copper in the feeder portion of the loop. Both BCPM and Hatfield specify a cross-over based on feeder length. WorldCom believes the proper cross-over will be based on the specific and dynamic loop design in each wire center. The simplest algorithm would be to serve any subscriber within 18 kf route distance of the wire-center on all copper loops – there would be no fiber deployed in loops serving these customers. The cross-over between 26 gauge feeder and 24 gauge distribution can be determined as the models now determine where to locate feeder/distribution interfaces, recognizing that about a quarter of these copper only loops will have no distribution plant – the feeder cable will terminate directly on a cross-connect panel at the customer's location. Moving beyond the 18 kf mark, customers would be served via DLC. DLC base unit locations would be defined as a DLC is filled. The location of the DLC base should be determined based on the minimized sum of distribution distances of all customers served from that DLC with the length of the fiber feeder being irrelevant to the decision where to locate the DLC base unit. In this construct, some customers would be served from DLCs that are further from the wire-center than the customer's premises.

An alternative design process would start with the most remote customer to be served from any wire-center and would work toward the wire center rather than from the wire center. If the Commission decides to model "landline" only technologies, this might be a more efficient design approach.

Below, WorldCom encourages the Commission to consider fixed wireless alternatives for sparsely populated areas and, therefore, suggests the Commission keep its "inside-out" design algorithm.

Wireless Technology

Concerning wireless solutions, there is very little domestic experience with wireless applications for basic service. The Commission long has sponsored a spectrum allocation for basic exchange telephone radio service (BETRS), but the technology is expensive and used rather infrequently. More recently, the Commission has allocated spectrum for, and industry has made significant progress in, the design of radio products for both mobile and fixed wireless applications. In this country, fixed wireless applications have developed slowly (if at all) because the incumbent LECs already have provided landline basic services. If we look at current experiences in eastern and central Europe and in the Far East, we see fixed wireless installations in place providing basic telephone service. In fact, both Lucent and Nortel offer products in foreign markets that could be used easily in domestic applications. There seem to be two primary reasons that these technologies are not yet used here by competitors – first, there are other business opportunities offering greater rewards (for example, even after 13 years, look at the price of cellular service versus its cost); and, second, incumbents have not repriced local services based on cost, so rural service is heavily subsidized with the universal service and other subsidy benefits available only to the incumbents. If the Commission is successful in finding a method to manage "portable" universal service high-cost support, competitors likely will find these rural markets more attractive. In any event, the Commission should include this technology in its universal service cost model.

The potential benefit of a fixed wireless solution (particularly for rural areas) became obvious in an early September workshop where BCPM proponents displayed how, in certain rural wire centers, their model would place multiple DLC base units each serving only a few (in some cases, only one or two) customers. Obviously, the cost to serve these individuals was very high. While this BCPM solution would be somewhat ameliorated if the Commission were to adopt the 18 kf cooper loop solution recommended above rather than the 12 kf design of the BCPM model, a fixed wireless solution could reach customers over a radius of up to 130 kf. The Commission already has scheduled one public presentation of a Nortel fixed wireless product.[5] Other

[5] In its Comments filed in this proceeding, Nortel has offered a broad description of its fixed wireless product including very generic costing information. Even this preliminary cost information suggests the investment to serve customers via fixed wireless technologies might range from $500 to $2,000 per customer and "is unlikely to exceed $5,000 per line connected (except in VERY low density isolated situations)." This maximum is half the value assumed by BCPM. Comments of Northern Telecom, Inc., CC Docket Nos. 96-45 and 97-160, September 24, 1997.

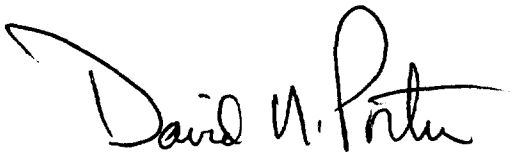
vendors also offer wireless solutions. For example, Lucent offers a "Multiple Access Radio" product in some markets. This technology uses point-to-point radio to connect a remote unit to a wire-center. Service is extended from the remote unit to the subscriber using landline loops. And, of course, the Commission may continue removing restrictions from its current spectrum allocations to allow operators to offer fixed as well as mobile applications using cellular and PCS spectrum. In any event, WorldCom strongly recommends that the Commission include at least one fixed wireless alternative in its universal service cost model.

Summary

WorldCom urges the Commission to: (1) base its customer location algorithm on geo-coded customer locations overlaid on geo-coded road and wire center boundary maps; (2) include unserved households in its model demand function; (3) base the landline loop construction method, in part, on terrain variables; (4) adopt a loop standard based on a 1,500 ohm central office resistance design limit; (5) require use of 26 gauge copper in copper feeder cables; (6) require use of 24 gauge copper in distribution cables; (7) require use of both standard and long-loop DLC plug-ins; (8) use no fiber on loops shorter than 18 kf; (9) base DLC placement on the minimized sum of distances from the DLC to customers served by that DLC; and, (10) include a fixed wireless technology option in the model.

WorldCom will continue working with the Commission and others in the industry to develop a credible forward-looking cost model to use to determine an appropriate level of universal service support for high-cost areas.

Thank you,



David N. Porter
Vice President – Government Affairs

cc: CC Docket Nos. 96-45 and 97-160 Service List

The Honorable Reed E. Hundt
Chairman
Federal Communications Commission
1919 M Street, N.W. - Room 814
WDC 20554

The Honorable Rachelle B. Chong
Commissioner
Federal Communications Commission
1919 M Street, N.W. - Room 844
WDC 20554

The Honorable Susan Ness
Commissioner
Federal Communications Commission
1919 M Street, N.W. - Room 832
WDC 20554

The Honorable James H. Quello
Commissioner
Federal Communications Commission
1919 M Street, N.W. - Room 802
WDC 20554

William F. Caton (Orig. + 11 copies)
Acting Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
WDC 20554

Tom Boasberg
Office of Chairman Hundt
Federal Communications Commission
1919 M Street, N.W. - Room 814
WDC 20554

James Casserly
Office of Commissioner Ness
Federal Communications Commission
1919 M Street, N.W. - Room 832
WDC 20554

Kathleen Franco
Common Carrier Bureau
Federal Communications Commission
1919 M Street, N.W. - Room 500
WDC 20554

Emily Hoffnar, Federal Staff Chair
Accounting and Audits Division
Universal Service Branch
Federal Communications Commission
2100 M Street, N.W. - Room 8617
WDC 20554

Sheryl Todd (8 copies plus diskette)
Accounting and Audits Division
Universal Service Division
Federal Communications Commission
2100 M Street, N.W. - Room 8611
WDC 20554

Timothy Peterson
Deputy Division Chief
Accounting and Audits Division
Federal Communications Commission
2100 M Street, N.W. - Room 8613
WDC 20554

Lori Kenyon
Alaska Public Utilities Commission
1016 West Sixth Avenue
Suite 400
Anchorage, Alaska 99501

The Honorable Julia Johnson, Chairman
Bridget Duff, State Staff Chair
Florida Public Service Commission
2540 Shumard Oak Blvd.
Gerald Hunter Building
Tallahassee, FL 32399-0850

The Honorable David Baker
Commissioner
Tiane Sommer
Georgia Public Service Commission
244 Washington Street, S.W.
Atlanta, GA 30334-5701

The Honorable Sharon L. Nelson
Chairman
WA Utilities and Transportation Comm.
1300 South Evergreen Park Drive, S.W.
P. O. Box 47250
Olympia, WA 98504-7250

The Honorable Laska Schoenfelder
Commissioner
Charles Bolle
SD Public Utilities Comm.
State Capitol, 500 East Capitol Street
Pierre, SD 57501-5070

Martha S. Hogerty
Missouri Office of Public Council
301 West High Street
Suite 250
Jefferson City, MO 65102

Deonne Brunning
Nebraska Public Service Comm.
300 The Atrium, 1200 N Street
P. O. Box 94927
Lincoln, NE 68509-4927

Rowland Curry
Texas Public Utility Commission
171 North Congress Avenue
P. O. Box 13326
Austin, TX 78701

Debra M. Kriete
PA Public Utilities Commission
North Office Building - Room 110
Commonwealth and North Avenues
P. O. Box 3265
Harrisburg, PA 17105-3265

Sandra Makeoff
Iowa Utilities Board
Lucas State Office Building
Des Moines, IA 50319

Philip F. McClelland
PA Office of Consumer Advocate
1425 Strawberry Square
Harrisburg, PA 17120

Thor Nelson
CO Office of Consumer Counsel
1580 Logan Street, N.W.
Suite 610
Denver, CO 80203

Barry Payne
IN Office of the Consumer Counsel
100 North Senate Avenue
Room N501
Indianapolis, IN 46204-2208

James B. Ramsay
NARUC
1100 Pennsylvania Avenue, N.W.
P. O. Box 684
WDC 20044-0684

Brian Roberts
CA Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Kevin Schwenzfeier
NYS Dept. of Public Service
3 Empire Plaza
Albany, NY 12223

ITS
2100 M Street, N.W.
Suite 140
WDC 20037

David L. Lawson
Scott M. Bohannon
AT&T Corp.
1722 I Street, N.W.
WDC 20006

Mark C. Rosenblum
Peter H. Jacoby
AT&T Corp.
Room 3245H1
295 North Maple Avenue
Basking Ridge, NJ 07920

Mary J. Sisak
MCI Telecommunications Corp.
1801 Pennsylvania Avenue, N.W.
WDC 20006

Gail L. Polivy
GTE Service Corp.
1850 M Street, N.W
Suite 1200
WDC 20036

Richard McKenna
GTE Telephone Operations
600 Hidden Ridge
Irving, TX 75038

R. Michael Senkowski
Jeffrey S. Linder
Gregory J. Vogt
Wiley, Rein & Fielding
1776 K Street, N.W.
WDC 20006

M. Robert Sutherland
Richard J. Sbaratta
Rebecca M. Lough
BellSouth Corp.
1155 Peachtree Street, N.E. - Suite 1700
Atlanta, GA 30309-3610

Robert B. McKenna
John L. Taylor
U S West, Inc.
1020 19th Street, N.W. - Suite 700
WDC 20036

Jay C. Keithley
Sandra K. Williams
Sprint
1850 M Street, N.W. - Suite 1110
WDC 20036

Robert M. Lynch/Durward D. Dupre
Michael J. Zpevak/Darryl W. Howard
Southwestern Bell Telephone Co.
One Bell Center
Room 3524
St. Louis, MO 63101

Nancy Woolf
Pacific Bell/Nevada Bell
140 New Montgomery Street
San Francisco, CA 94105

Robert A. Mazer
Albert Shuldiner
Counsel for Aliant Communications Co.
Vinson & Elkins, L.L.P.
1455 Pennsylvania Avenue, N.W.
WDC 20004-1008

Margot Smiley Humphrey
Koteen & Naftalin, L.L.P.
1150 Connecticut Avenue, N.W.
Suite 1000
WDC 20036

Joe D. Edge
Tina M. Pidgeon
Drinker, Biddle & Reath LLP
901 Fifteenth Street, N.W.
Suite 900
WDC 20005

Larry A. Peck
Michael S. Pabian
Attorneys for Ameritech
2000 West Ameritech Center Drive
Room 4H86
Hoffman Estates, IL 60196-1025